

## RADIO TEST REPORT

The device described below is tested by Dongguan Nore Testing Center Co., Ltd. to determine the maximum emission levels emanating from the device, the severe levels which the device can endure and E.U.T.'s performance criterion. The test results, data evaluation, test procedures, and equipment of configurations shown in this report were made in accordance with the procedures in ANSI C63.10(2013).

Applicant : Belcat Co.,Ltd  
Address : Linghu-Industrial Park, Qiuchang-Town, Huiyang-District, Huizhou-City, Guangdong, China  
Manufacturer/Factory : Belcat Co.,Ltd  
Address : Linghu-Industrial Park, Qiuchang-Town, Huiyang-District, Huizhou-City, Guangdong, China  
E.U.T. : WIRELESS TRANSMITTER  
Brand Name : N/A  
Model No. : T-1, T-2, T-3, T-4, T-5, T-6, T-7, T-8, T-9, TWINS-G, R-1, R-2, R-3, R-4, R-5, R-6, R-7, R-8, R-9, TWINS-A, SW-200, SW-300, SW-400, SW-500, SW-600, SW-700, SW-800, SW-900  
(For model difference, refer to section 2.1)  
FCC ID : 2ALB4-T-1  
Measurement Standard : FCC PART 15.249: 2016  
Date of Receiver : September 20, 2016  
Date of Test : September 20, 2016 to December 12, 2016  
Date of Report : December 12, 2016

This Test Report is Issued Under the Authority of :

Prepared by



Rose Hu / Engineer

Approved & Authorized Signer



Iori Fan / Authorized Signatory

This test report is for the customer shown above and their specific product only. This report applies to above tested sample only and shall not be reproduced in part without written approval of Dongguan Nore Testing Center Co., Ltd.

## Table of Contents

|                                                        |           |
|--------------------------------------------------------|-----------|
| <b>1. GENERAL INFORMATION .....</b>                    | <b>4</b>  |
| 1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST ..... | 4         |
| 1.2 RELATED SUBMITTAL(S) / GRANT (S).....              | 6         |
| 1.3 TEST METHODOLOGY .....                             | 6         |
| 1.4 EQUIPMENT MODIFICATIONS .....                      | 6         |
| 1.5 SUPPORT DEVICE .....                               | 6         |
| 1.6 TEST FACILITY AND LOCATION.....                    | 7         |
| 1.7 SUMMARY OF TEST RESULTS .....                      | 8         |
| <b>2. SYSTEM TEST CONFIGURATION.....</b>               | <b>9</b>  |
| 2.1 EUT CONFIGURATION .....                            | 9         |
| 2.2 SPECIAL ACCESSORIES.....                           | 9         |
| 2.3 DESCRIPTION OF TEST MODES .....                    | 9         |
| <b>3. CONDUCTED EMISSIONS TEST .....</b>               | <b>10</b> |
| 3.1 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....  | 10        |
| 3.2 TEST CONDITION .....                               | 10        |
| 3.3 MEASUREMENT RESULTS.....                           | 10        |
| <b>4. RADIATED EMISSION AND BAND EDGE TEST .....</b>   | <b>13</b> |
| 4.1 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....  | 13        |
| 4.2 MEASUREMENT PROCEDURE .....                        | 14        |
| 4.3 LIMIT.....                                         | 15        |
| 4.4 MEASUREMENT RESULTS .....                          | 16        |
| <b>5. 20DB BANDWIDTH.....</b>                          | <b>20</b> |
| 5.1 MEASUREMENT PROCEDURE .....                        | 20        |
| 5.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....  | 20        |
| 5.3 MEASUREMENT RESULTS.....                           | 20        |
| <b>6. ANTENNA REQUIREMENT .....</b>                    | <b>23</b> |
| 6.1 MEASUREMENT PROCEDURE .....                        | 23        |
| 6.2 MEASUREMENT RESULTS.....                           | 23        |
| <b>7. TEST EQUIPMENT LIST.....</b>                     | <b>24</b> |

## Revision History of This Test Report

| Report Number | Description   | Issued Date |
|---------------|---------------|-------------|
| NTC1609112F   | Initial Issue | 2016-12-12  |
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## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment under Test

This device is a Wireless transmitter, it's powered by DC 3.7 come from li-ion battery or DC 5V come from USB port. For more details features, please refer to User's Manual.

|                  |                                                                                                                                                                                                                                 |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power Supply     | : DC 5V come from USB Port,<br>DC 3.7V li-ion battery                                                                                                                                                                           |
| Adapter          | : None                                                                                                                                                                                                                          |
| Test voltage     | : AC 120V 60Hz Adapter input,<br>DC 3.7V li-ion battery<br>(Only the worst case was recorded in the report.)                                                                                                                    |
| Model name       | : T-1, T-2, T-3, T-4, T-5, T-6, T-7, T-8, T-9,<br>TWINS-G, R-1, R-2, R-3, R-4, R-5, R-6, R-7, R-8,<br>R-9, TWINS-A, SW-200, SW-300, SW-400,<br>SW-500, SW-600, SW-700, SW-800, SW-900<br>(All tests were carried on model T-1.) |
| Model difference | : These models have the same circuitry, PCB<br>layout and physical construction. The differences<br>in model number due to trading purpose.                                                                                     |
| Hardware version | : HZ-2814TX V02                                                                                                                                                                                                                 |
| Software version | : V1.0                                                                                                                                                                                                                          |
| Serial number    | : N/A                                                                                                                                                                                                                           |
| Note             | : N/A                                                                                                                                                                                                                           |

**Technical Specification:**

Frequency Range : 905-923MHz  
Modulation Type : FM  
Channel Space : 3MHz  
Number of Channel : 7  
Antenna Type : Integral  
Antenna Gain : 1.1 dBi (Declaration by manufacturer)

**Channel list:**

| Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|
| 1       | 905       | 5       | 917       |
| 2       | 908       | 6       | 920       |
| 3       | 911       | 7       | 923       |
| 4       | 914       |         |           |

## 1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: 2ALB4-T-1 filing to comply with Section 15.249 of the FCC Part 15 (2016), Subpart C Rule.

## 1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters.

## 1.4 Equipment Modifications

Not available for this EUT intended for grant.

## 1.5 Support Device

Adapter : Model: BSYC050200UW  
Input: AC100-240V 50/60Hz 0.5A  
Output: DC 5.0V 2000mA

## 1.6 Test Facility and Location

Listed by CNAS, August 14, 2015  
The certificate is valid until August 13, 2018  
The Laboratory has been assessed and proved to be  
in compliance with CNAS/CL01  
The Certificate Registration Number is L5795.

Listed by FCC, July 03, 2014  
The Certificate Registration Number is 665078.  
Listed by Industry Canada, June 18, 2014  
The Certificate Registration Number is 46405-9743.

Dongguan NTC Co., Ltd.  
(Full Name: Dongguan Nore Testing Center Co., Ltd.)

Building D, Gaosheng Science and Technology Park, Hongtu Road,  
Nancheng District, Dongguan City, Guangdong, China  
(Full Name: Building D, Gaosheng Science & Technology Park,  
Zhouxi Longxi Road, Nancheng District, Dongguan, Guangdong, China.

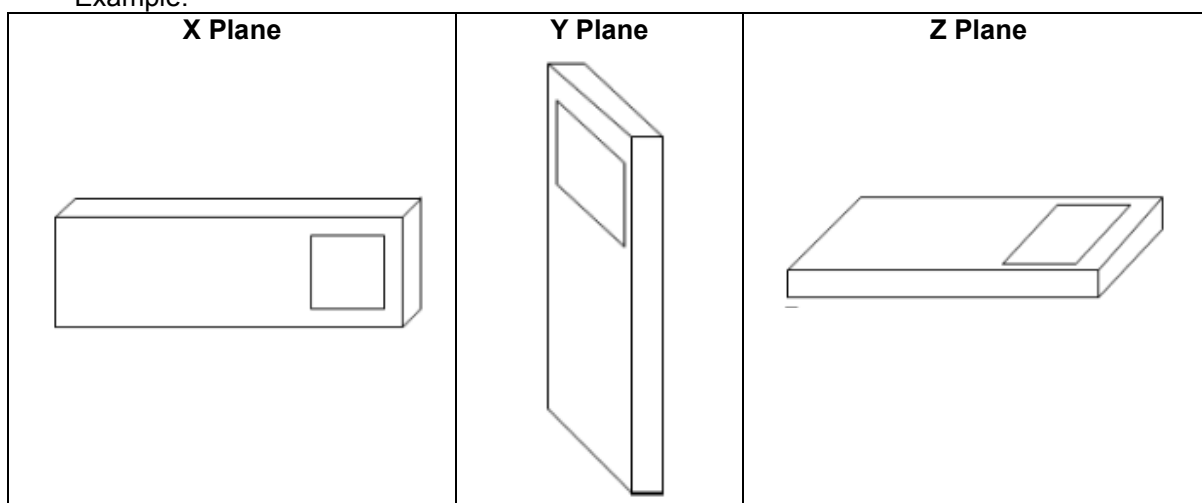
## 1.7 Summary of Test Results

| FCC Rules          | Description Of Test         | Uncertainty               | Result    |
|--------------------|-----------------------------|---------------------------|-----------|
| §15.207(a)         | AC Power Conducted Emission | ±1.06dB                   | Compliant |
| §15.249(a)/ 15.209 | Radiated Emissions          | ±3.70dB                   | Compliant |
| §15.249(d)/ 15.205 | Band Edge                   | ±1.70dB                   | Compliant |
| §15.215(c)         | 20dB Bandwidth              | ±1.42 x10 <sup>-4</sup> % | Compliant |
| §15.203            | Antenna Requirement         | ±0.60dB                   | Compliant |

Note: 1. The EUT has been tested as an independent unit. And Continual transmitting in maximum power (the fully-charged battery is used during the measurement)

2. The EUT powered by battery and operating multiple positions, so the EUT shall be performed three orthogonal planes. The worst plane is Z.

Example:



## **2. System Test Configuration**

### **2.1 EUT Configuration**

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### **2.2 Special Accessories**

Not available for this EUT intended for grant.

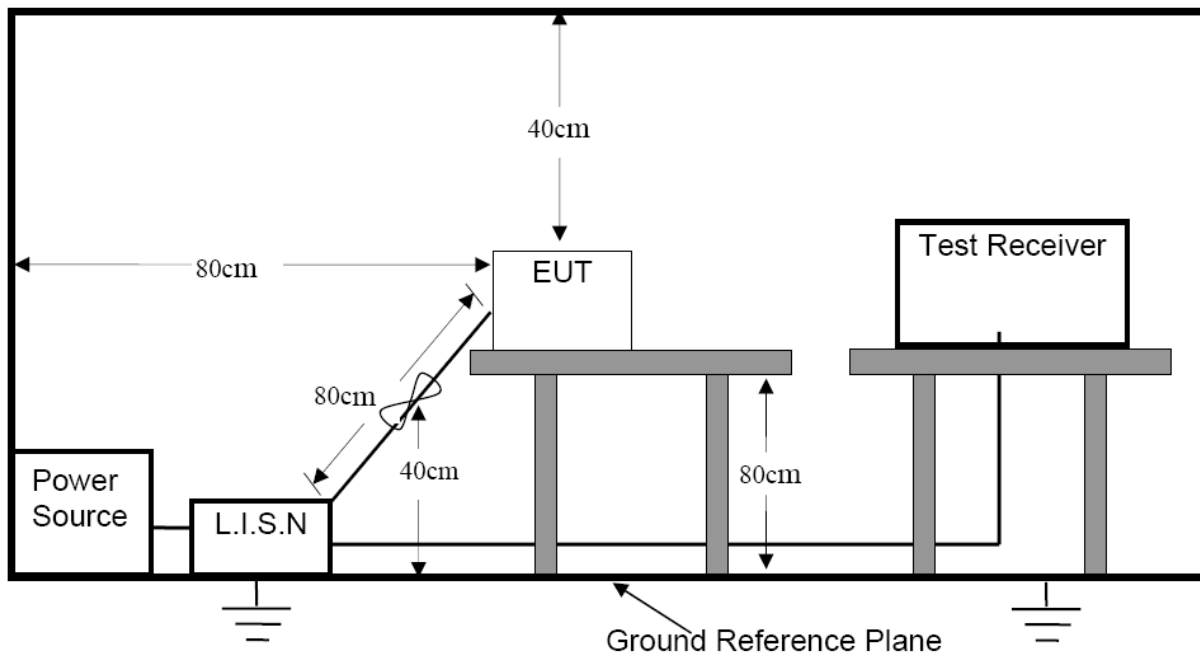
### **2.3 Description of test modes**

The EUT has been tested under operating condition.

The EUT has been tested under continuous operating condition. The Lowest, middle and highest channel were chosen for testing, and modulation type FM and all data rate were tested. But only the worst case data is shown in this report.

### 3. Conducted Emissions Test

#### 3.1 Test SET-UP (Block Diagram of Configuration)



#### 3.2 Test Condition

**Test Requirement: FCC Part 15.207**

**Frequency Range: 150KHz ~ 30MHz**

**Detector: RBW 9KHz, VBW 30KHz**

**Operation Mode: Charging+TX Mode**

#### 3.3 Measurement Results

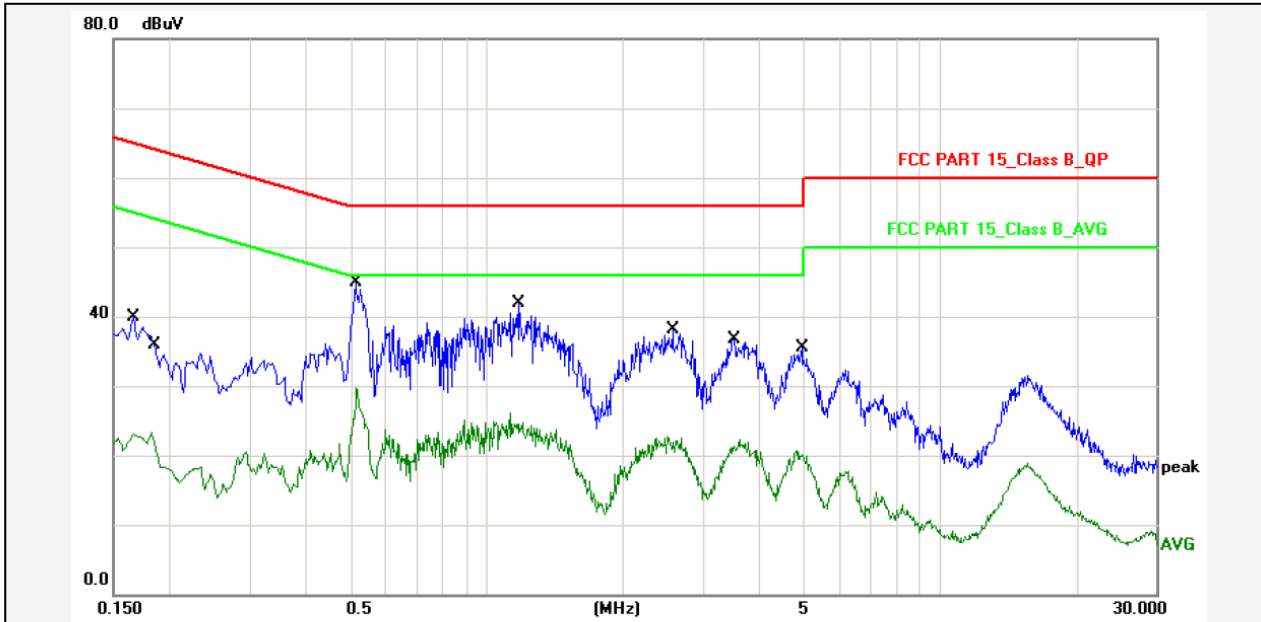
**Please refer to following plots of the worst case: High channel.**



**Dongguan NTC Co., Ltd.**  
Tel: +86-769-22022444 Fax: +86-769-22022799  
Web: [Http://www.ntc-c.com](http://www.ntc-c.com)

Site: Conduction

Test Time: 2016-11-14 18:17:27



Report No.: T-1

Test Standard: FCC PART 15\_Class B\_QP

Test item: Conducted Emission

Applicant: Belcat

Product: WIRELESS TRANSMITTER

Model No.: T-1

Phase: L1

Temp.( )/Hum.(%): 22(C) / 52 %

Power Rating: AC 120V/60Hz

Test Engineer: Jerry

Test Mode: Charging+TX

Remark:

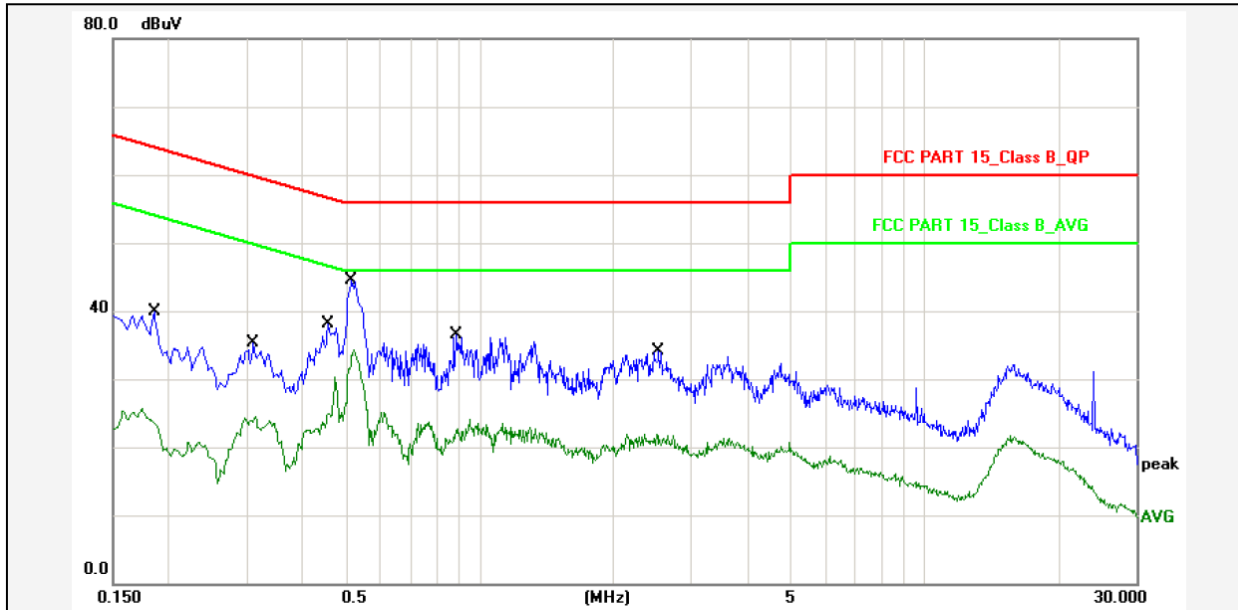
| No. | Frequency (MHz) | Factor (dBuV) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F | Remark |
|-----|-----------------|---------------|----------------|--------------|--------------|-------------|----------|-----|--------|
| 1   | 0.1660          | 10.80         | 27.10          | 37.90        | 65.15        | -27.25      | QP       | P   |        |
| 2   | 0.1860          | 10.80         | 10.60          | 21.40        | 54.21        | -32.81      | AVG      | P   |        |
| 3   | 0.5140          | 10.80         | 32.00          | 42.80        | 56.00        | -13.20      | QP       | P   |        |
| 4   | 0.5140          | 10.80         | 16.80          | 27.60        | 46.00        | -18.40      | AVG      | P   |        |
| 5   | 1.1820          | 10.80         | 29.00          | 39.80        | 56.00        | -16.20      | QP       | P   |        |
| 6   | 1.1820          | 10.80         | 13.30          | 24.10        | 46.00        | -21.90      | AVG      | P   |        |
| 7   | 2.5740          | 10.80         | 25.40          | 36.20        | 56.00        | -19.80      | QP       | P   |        |
| 8   | 2.5740          | 10.80         | 9.90           | 20.70        | 46.00        | -25.30      | AVG      | P   |        |
| 9   | 3.5260          | 10.80         | 23.90          | 34.70        | 56.00        | -21.30      | QP       | P   |        |
| 10  | 3.5260          | 10.80         | 9.80           | 20.60        | 46.00        | -25.40      | AVG      | P   |        |
| 11  | 4.9580          | 10.80         | 22.60          | 33.40        | 56.00        | -22.60      | QP       | P   |        |
| 12  | 4.9580          | 10.80         | 7.90           | 18.70        | 46.00        | -27.30      | AVG      | P   |        |



**Dongguan NTC Co., Ltd.**  
Tel: +86-769-22022444 Fax: +86-769-22022799  
Web: [Http://www.ntc-c.com](http://www.ntc-c.com)

Site: Conduction

Test Time: 2016-11-14 18:14:41



Report No.: T-1

Test Standard: FCC PART 15\_Class B\_QP

Test item: Conducted Emission

Phase: N

Applicant: Belcat

Temp.( )/Hum.(%): 22(C) / 52 %

Product: WIRELESS TRANSMITTER

Power Rating: AC 120V/60Hz

Model No.: T-1

Test Engineer: Jerry

Test Mode: Charging+TX

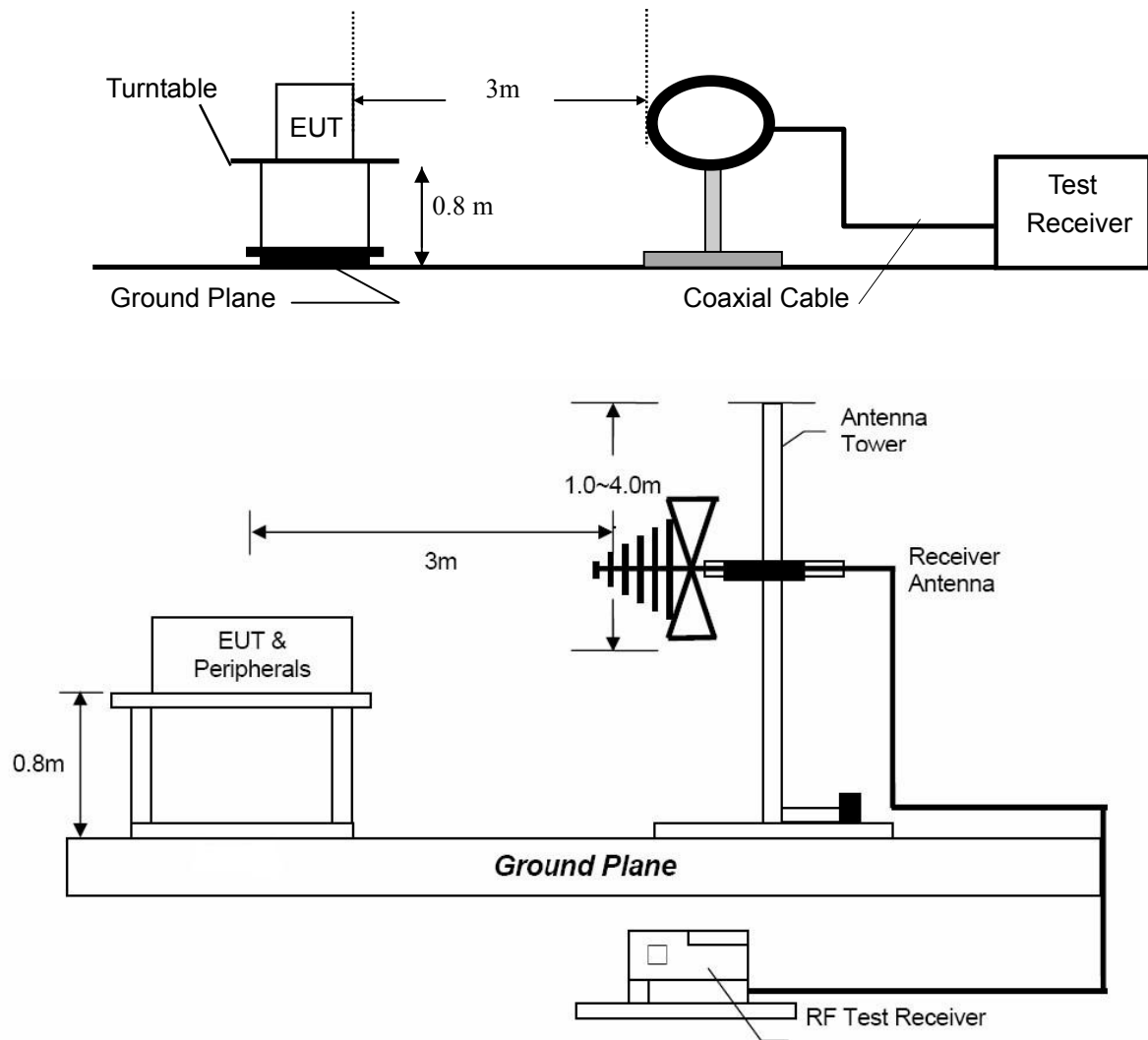
Remark:

| No. | Frequency (MHz) | Factor (dBuV) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F | Remark |
|-----|-----------------|---------------|----------------|--------------|--------------|-------------|----------|-----|--------|
| 1   | 0.1860          | 10.80         | 27.00          | 37.80        | 64.21        | -26.41      | QP       | P   |        |
| 2   | 0.1860          | 10.80         | 12.00          | 22.80        | 54.21        | -31.41      | AVG      | P   |        |
| 3   | 0.3100          | 10.80         | 22.60          | 33.40        | 59.97        | -26.57      | QP       | P   |        |
| 4   | 0.3100          | 10.80         | 11.70          | 22.50        | 49.97        | -27.47      | AVG      | P   |        |
| 5   | 0.4580          | 10.80         | 25.30          | 36.10        | 56.73        | -20.63      | QP       | P   |        |
| 6   | 0.4580          | 10.80         | 17.50          | 28.30        | 46.73        | -18.43      | AVG      | P   |        |
| 7   | 0.5180          | 10.80         | 31.60          | 42.40        | 56.00        | -13.60      | QP       | P   |        |
| 8   | 0.5180          | 10.80         | 21.60          | 32.40        | 46.00        | -13.60      | AVG      | P   |        |
| 9   | 0.8860          | 10.80         | 23.60          | 34.40        | 56.00        | -21.60      | QP       | P   |        |
| 10  | 0.8860          | 10.80         | 11.30          | 22.10        | 46.00        | -23.90      | AVG      | P   |        |
| 11  | 2.5380          | 10.80         | 21.30          | 32.10        | 56.00        | -23.90      | QP       | P   |        |
| 12  | 2.5380          | 10.80         | 8.90           | 19.70        | 46.00        | -26.30      | AVG      | P   |        |

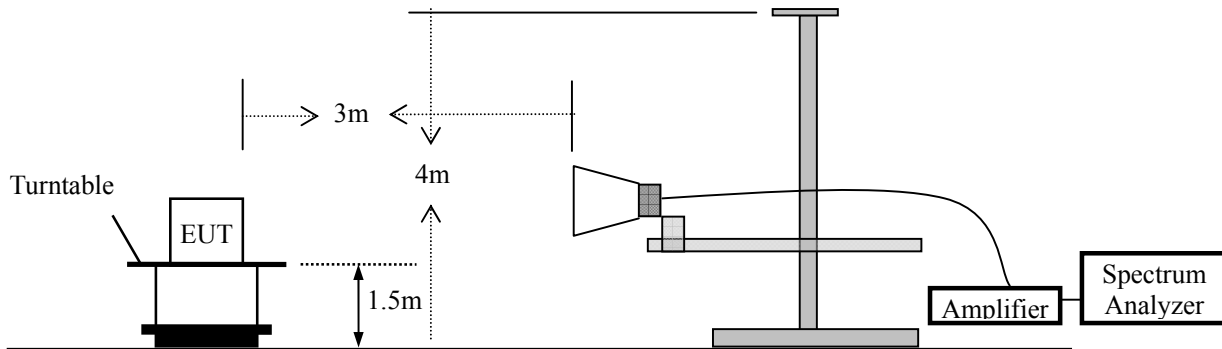
## 4. Radiated Emission and Band Edge Test

### 4.1 Test SET-UP (Block Diagram of Configuration)

#### 4.1.1 Radiated Emission Test Set-Up, Frequency Below 30MHz



#### 4.1.2 Radiated Emission Test Set-Up, Frequency above 1GHz



#### 4.2 Measurement Procedure

- Blow 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic chamber room.
- For the radiated emission test above 1GHz:  
The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode.
- A Quasi-peak measurement was then made for that frequency point for below 1GHz test. PK and AV for above 1GHz emission test.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

| Frequency Band (MHz) | Level   | Resolution Bandwidth | Video Bandwidth |
|----------------------|---------|----------------------|-----------------|
| 30 to 1000           | QP      | 120 kHz              | 300 kHz         |
| Above 1000           | Peak    | 1 MHz                | 3 MHz           |
|                      | Average | 1 MHz                | 10 Hz           |

#### 4.3 Limit

| Frequency range MHz | Distance Meters | Field Strengths Limit (15.209)          |                                                  |
|---------------------|-----------------|-----------------------------------------|--------------------------------------------------|
|                     |                 | $\mu\text{V/m}$                         |                                                  |
| 0.009 ~ 0.490       | 300             | 2400/F(kHz)                             |                                                  |
| 0.490 ~ 1.705       | 30              | 24000/F(kHz)                            |                                                  |
| 1.705 ~ 30          | 30              | 30                                      |                                                  |
| 30 ~ 88             | 3               | 100                                     |                                                  |
| 88 ~ 216            | 3               | 150                                     |                                                  |
| 216 ~ 960           | 3               | 200                                     |                                                  |
| Above 960           | 3               | 500                                     |                                                  |
| Frequency range MHz | Distance Meters | Field Strengths Limit (15.249)          |                                                  |
|                     |                 | mV/m<br>(Field strength of fundamental) | $\mu\text{V/m}$<br>(Field strength of Harmonics) |
| 902 ~ 928           | 3               | 50                                      | 500                                              |
| 2400 ~ 2483.5       | 3               | 50                                      | 500                                              |
| 5725 ~ 5875         | 3               | 50                                      | 500                                              |
| 24000 ~ 2425000     | 3               | 250                                     | 2500                                             |

- Remark : (1) Emission level (dB) $\mu\text{V}$  = 20 log Emission level  $\mu\text{V/m}$   
(2) The smaller limit shall apply at the cross point between two frequency bands.  
(3) As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.  
(4) The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.

#### 4.4 Measurement Results

Please refer to following test plots of the worst case: TX Low channel.

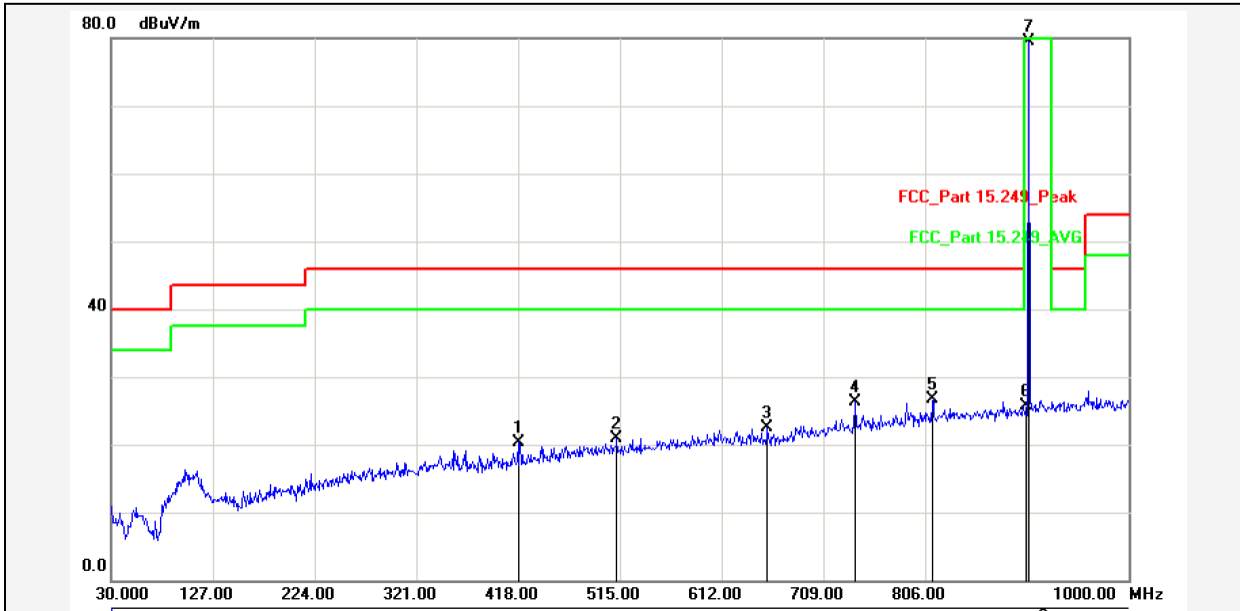
**For Spurious Emission, Fundamental radiation, Band Edge.**



**Dongguan NTC Co., Ltd.**  
Tel: +86-769-22022444 Fax: +86-769-22022799  
Web: <http://www.ntc-c.com>

Site: Radiation

Test Time: 2016-11-11 13:22:22



Report No.: T-1

Test Standard: FCC\_Part 15.249\_Peak

Test Distance: 3m

Test item: Radiation Emission

Ant. Polarization: Horizontal

Applicant: Belcat

Temp.(C)/Hum.(%): 22(C) / 54 %

Product: WIRELESS TRANSMITTER

Power Rating: AC 120V/60Hz

Model No.: T-1

Test Engineer: Chilam

Test Mode: Charging+TX

Remark: Low

| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg.) | P/F | Remark |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|----------------|-----|--------|
| 1   | 418.0000        | -8.68         | 28.98          | 20.30          | 46.00          | -25.70      | QP       |             |                | P   |        |
| 2   | 512.0900        | -6.74         | 27.56          | 20.82          | 46.00          | -25.18      | QP       |             |                | P   |        |
| 3   | 655.6499        | -5.01         | 27.46          | 22.45          | 46.00          | -23.55      | QP       |             |                | P   |        |
| 4   | 739.0700        | -2.85         | 29.20          | 26.35          | 46.00          | -19.65      | QP       |             |                | P   |        |
| 5   | 813.7599        | -1.71         | 28.37          | 26.66          | 46.00          | -19.34      | QP       |             |                | P   |        |
| 6   | 902.0000        | -1.19         | 26.86          | 25.67          | 46.00          | -20.33      | QP       |             |                | P   |        |
| 7   | 905.0000        | -1.14         | 80.56          | 79.42          | 94.00          | -14.58      | QP       |             |                | P   |        |

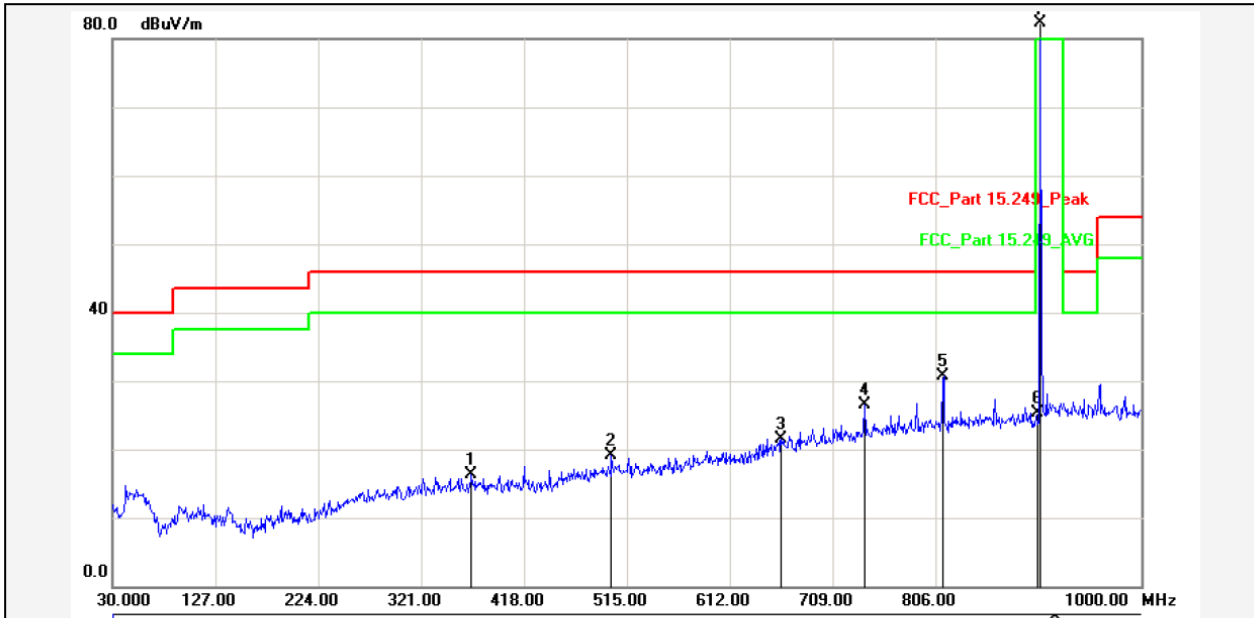
**Note: Below 30MHz, the emissions are lower than 20dB below the allowable limit.**



**Dongguan NTC Co., Ltd.**  
Tel: +86-769-22022444 Fax: +86-769-22022799  
Web: <http://www.ntc-c.com>

Site: Radiation

Test Time: 2016-11-11 13:30:31



Report No.: T-1

Test Standard: FCC\_Part 15.249\_Peak

Test item: Radiation Emission

Applicant: Belcat

Product: WIRELESS TRANSMITTER

Model No.: T-1

Test Distance: 3m

Ant. Polarization: Vertical

Temp.(C)/Hum.(%): 22(C) / 54 %

Power Rating: AC 120V/60Hz

Test Engineer: Chilam

Test Mode: Charging+TX

Remark: Low

| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg.) | P/F | Remark |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|----------------|-----|--------|
| 1   | 368.5299        | -11.17        | 27.40          | 16.23          | 46.00          | -29.77      | QP       |             |                | P   |        |
| 2   | 500.4499        | -8.76         | 27.81          | 19.05          | 46.00          | -26.95      | QP       |             |                | P   |        |
| 3   | 660.5000        | -4.87         | 26.46          | 21.59          | 46.00          | -24.41      | QP       |             |                | P   |        |
| 4   | 739.0700        | -2.85         | 29.41          | 26.56          | 46.00          | -19.44      | QP       |             |                | P   |        |
| 5   | 813.7599        | -1.71         | 32.42          | 30.71          | 46.00          | -15.29      | QP       |             |                | P   |        |
| 6   | 902.0000        | -1.19         | 26.50          | 25.31          | 46.00          | -20.69      | QP       |             |                | P   |        |
| 7   | 905.0000        | -1.14         | 83.49          | 82.35          | 94.00          | -11.65      | QP       |             |                | P   |        |

**Note:** Below 30MHz, the emissions are lower than 20dB below the allowable limit.

## For Harmonic radiation.

Frequency range: 30MHz~10GHz  
Operation Mode: TX  
Test Result: PASS Temperature : 22 °C  
Measured Distance: 3m Humidity : 54 %  
Test Date : November 11, 2016 Test By: Anson

| Freq.<br>(MHz)                 | Ant.Pol.<br>(H/V) | Reading<br>Level(dBuV) |       | Factor<br>(dB/m) | Emission Level<br>(dBuV) |       | Limit 3m<br>(dBuV/m) |       | Margin<br>(dB) |        |
|--------------------------------|-------------------|------------------------|-------|------------------|--------------------------|-------|----------------------|-------|----------------|--------|
|                                |                   | PK                     | AV    |                  | PK                       | AV    | PK                   | AV    | PK             | AV     |
| Operation Mode: TX Mode (Low)  |                   |                        |       |                  |                          |       |                      |       |                |        |
| 1810                           | V                 | 30.6                   | 26.13 | 14.72            | 45.32                    | 40.85 | 74.00                | 54.00 | -28.68         | -13.15 |
| 2715                           | V                 | 29.35                  | 21.47 | 20.74            | 50.09                    | 42.21 | 74.00                | 54.00 | -23.91         | -11.79 |
| ---                            |                   |                        |       |                  |                          |       |                      |       |                |        |
| 1810                           | H                 | 37.62                  | 28.24 | 14.72            | 52.34                    | 42.96 | 74.00                | 54.00 | -21.66         | -11.04 |
| 2715                           | H                 | 30.3                   | 23.51 | 20.74            | 51.04                    | 44.25 | 74.00                | 54.00 | -22.96         | -9.75  |
| ---                            |                   |                        |       |                  |                          |       |                      |       |                |        |
| Operation Mode: TX Mode (Mid)  |                   |                        |       |                  |                          |       |                      |       |                |        |
| 1834                           | V                 | 36.48                  | 28.8  | 14.93            | 51.41                    | 43.73 | 74.00                | 54.00 | -22.59         | -10.27 |
| 2751                           | V                 | 31.45                  | 23.74 | 20.88            | 52.33                    | 44.62 | 74.00                | 54.00 | -21.67         | -9.38  |
| ---                            |                   |                        |       |                  |                          |       |                      |       |                |        |
| 1834                           | H                 | 37.36                  | 28.48 | 14.93            | 52.29                    | 43.41 | 74.00                | 54.00 | -21.71         | -10.59 |
| 2751                           | H                 | 32.86                  | 23.5  | 20.88            | 53.74                    | 44.38 | 74.00                | 54.00 | -20.26         | -9.62  |
| ---                            |                   |                        |       |                  |                          |       |                      |       |                |        |
| Operation Mode: TX Mode (High) |                   |                        |       |                  |                          |       |                      |       |                |        |
| 1846                           | V                 | 36.71                  | 29.77 | 15.15            | 51.86                    | 44.92 | 74.00                | 54.00 | -22.14         | -9.08  |
| 2769                           | V                 | 29.04                  | 20.37 | 21.04            | 50.08                    | 41.41 | 74.00                | 54.00 | -23.92         | -12.59 |
| ---                            |                   |                        |       |                  |                          |       |                      |       |                |        |
| 1846                           | H                 | 36.26                  | 29.1  | 15.15            | 51.41                    | 44.25 | 74.00                | 54.00 | -22.59         | -9.75  |
| 2769                           | H                 | 29.88                  | 24.47 | 21.04            | 50.92                    | 45.51 | 74.00                | 54.00 | -23.08         | -8.49  |
| ---                            |                   |                        |       |                  |                          |       |                      |       |                |        |

- Note:**
- (1) All Readings are Peak Value and AV.
  - (2) Emission Level= Reading Level + Factor
  - (3) Factor= Antenna Gain + Cable Loss – Amplifier Gain
  - (4) Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 10dB below the permissible limits.
  - (5) Measurement uncertainty :  $\pm 3.7$ dB.
  - (6) Horn antenna used for the emission over 1000MHz.

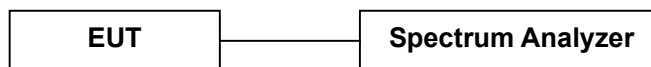
## 5. 20dB Bandwidth

### 5.1 Measurement Procedure

The 20dB bandwidth of the emission was contained within the frequency band designated which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over excepted variations in temperature and supply voltage were considered, FCC Rule 15.215(c):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RBW was chosen so that the display was a result of the hopping channel modulation. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. Use the spectrum 20dB down delta function to measure the bandwidth.

### 5.2 Test SET-UP (Block Diagram of Configuration)

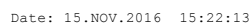


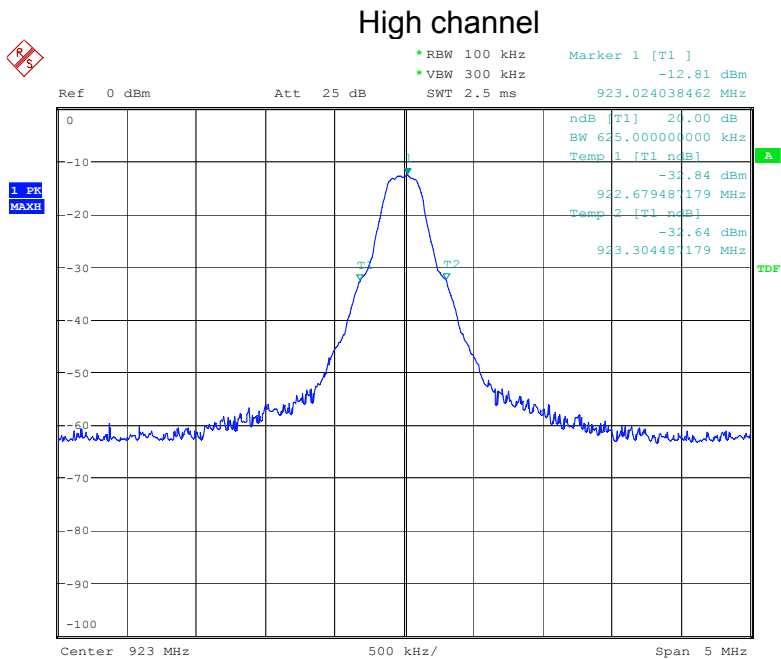
### 5.3 Measurement Results

Refer to attached data chart.

|                    |       |               |                   |
|--------------------|-------|---------------|-------------------|
| RBW:               | 30KHz | VBW:          | 100KHz            |
| Spectrum Detector: | PK    | Temperature : | 22 °C             |
| Test By:           | Sance | Humidity :    | 54 %              |
| Test Result:       | PASS  | Test Date :   | November 15, 2016 |

| Channel frequency (MHz) | 20dB Down BW(kHz) |
|-------------------------|-------------------|
| 905                     | 641               |
| 917                     | 633               |
| 923                     | 625               |





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## **6. Antenna requirement**

### **6.1 Measurement Procedure**

According to of FCC part 15C section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

### **6.2 Measurement Results**

The antenna is Integral antenna and no consideration of replacement, and the best case gain of the antenna is 1.1dBi. So, the antenna is consider meet the requirement.

## 7. Test Equipment List

| Description                    | Manufacturer    | Model Number | Serial Number | Characteristics | Calibration Date | Calibration Due Date |
|--------------------------------|-----------------|--------------|---------------|-----------------|------------------|----------------------|
| Test Receiver                  | Rohde & Schwarz | ESCI7        | 100837        | 9KHz~7GHz       | Nov. 22, 2016    | Nov. 21, 2017        |
| Antenna                        | Schwarzbeck     | VULB9162     | 9162-010      | 30MHz~7GHz      | Nov. 25, 2016    | Nov. 24, 2017        |
| Positioning Controller         | UC              | UC 3000      | N/A           | 0~360°, 1-4m    | N/A              | N/A                  |
| Color Monitor                  | SUNSPO          | SP-140A      | N/A           | N/A             | N/A              | N/A                  |
| Single Phase Power Line Filter | SAEMC           | PF201A-32    | 110210        | 32A             | N/A              | N/A                  |
| 3 Phase Power Line Filter      | SAEMC           | PF401A-200   | 110318        | 200A            | N/A              | N/A                  |
| DC Power Filter                | SAEMC           | PF301A-200   | 110245        | 200A            | N/A              | N/A                  |
| Cable                          | Huber+Suhner    | CBL2-NN-1M   | 22390001      | 9KHz~7GHz       | Nov. 06, 2016    | Nov. 05, 2017        |
| Cable                          | Huber+Suhner    | CIL02        | N/A           | 9KHz~7GHz       | Nov. 06, 2016    | Nov. 05, 2017        |
| RF Cable                       | Huber+Suhner    | SF-104       | MY16559/4     | 9KHz~25GHz      | Mar. 06, 2016    | Mar. 05, 2017        |
| Power Amplifier                | HP              | HP 8447D     | 1145A00203    | 100KHz~1.3GHz   | Nov. 06, 2016    | Nov. 05, 2017        |
| Horn Antenna                   | Schwarzbeck     | BBHA9170     | 9170-372      | 15GHz~26.5GHz   | Oct.22, 2016     | Oct.21, 2017         |
| Horn Antenna                   | Com-Power       | AH-118       | 071078        | 1GHz~18GHz      | Nov. 04, 2016    | Nov. 03, 2017        |
| Loop antenna                   | Daze            | ZA30900A     | 0708          | 9KHz~30MHz      | Oct.09, 2016     | Oct.08, 2017         |
| Spectrum Analyzer              | Rohde & Schwarz | FSU26        | 200409/026    | 20Hz~26.5GHz    | Aug. 31, 2016    | Aug. 30, 2017        |
| Pre-Amplifier                  | Agilent         | 8449B        | 3008A02964    | 1GHz~26.5GHz    | Nov. 02, 2016    | Nov. 01, 2017        |
| L.I.S.N.                       | Rohde & Schwarz | ENV 216      | 101317        | 9KHz~30MHz      | Nov. 02, 2016    | Nov. 01, 2017        |
| Temporary antenna connector    | TESCOM          | SS402        | N/A           | 9KHz-25GHz      | N/A              | N/A                  |

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

---End---